VIA FACSIMILE (703) 872-9306

9D-HL-20031
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Remarks

The Office Action mailed December 10, 2004, and made final, has been carefully reviewed and the following remarks are made in consequence thereof.

Claims 1-10 and 12-26 are now pending in this application. Claims 1, 4, 5, 15-20, and 23 stand rejected. Claims 2, 3, 6-10, 21, 24, and 25 are objected to. Claim 12-14, 22 and 26 are allowed.

Applicants note that the Office Action contains a Response to Arguments filed by the Applicants on July 8, 2004 in response to the Office Action mailed on May 18, 2004. Applicants respectfully traverse the assertion in the Response to Arguments that Joslin shows a variable heat source and a variable speed motor.

The Response to Arguments cites col. 3, lines 33-35 as showing that the heater operates at more than one temperature, however a more thorough reading of the reference indicates that this is not the case. Joslin at col. 3, lines 25-36 states:

> "The dryer 10 is run in the reverse direction until either a desired reverse time (e.g., 3 minutes) or a desired reverse temperature x at the inlet of the drum 14 is exceeded.
>
> The reverse temperature x may be varied by an unshown selector switch to optimize the drying process for different fabrics. For example: delicates x=90° C.; knits x=95 ° C.; permanent press x=100 ° C.; cottons x=105 ° C.; and heavy dense articles x=110 ° C.
>
> When the desired reverse time or the desired reverse temperature x is exceeded, the motor 16 is stopped for period of time (e.g., 0.75 seconds) to allow the drum 14, the blower 20 and any articles being dried to stop moving."

Thus, the temperature x is clearly indicated to be the drum inlet temperature rather than a heater temperature. Joslin describes only one temperature sensor (18) located at

the drum inlet to sense air temperature entering the drum. Heater temperature is but one of several factors that can influence the drum inlet air temperature. For instance, Joslin, at col. 2, lines 59-61 states that the reduced airflow to the dryer during reverse operation increases the amount of heat transferred to the articles being dried. Further, after starting the dryer in the reverse direction, a delay (e.g., 10 seconds) is provided before temperatures are sensed by the sensor. This allows temperature transients resulting from stopping the motor 16 to dissipate (col. 3, lines 21-24). The same procedure is followed when the dryer is started in the forward direction as stated at col. 3., lines 41-44. Based on the foregoing, Applicants respectfully submit that Joslin neither describes nor suggests a variable heat source.

With regard to the blower, Joslin's claim 2 recites "[a] method according to claim 1, wherein said second airflow rate is less than seventy percent of said first airflow rate." Joslin's claim 2 makes no reference to the speed of the blower. Joslin describes the blower as a squirrel cage blower which is typically designed to have a maximum flow rate corresponding to revolution in a forward direction. When the blower is operated in the opposite direction, the "reverse direction" the blower still moves air in the same direction, but at a reduced rate. The reduced rate may be 70% or less of the maximum rate, and typically, the reduced rate is 50% of the maximum rate (col. 2, lines 19-25). Thus, the reduced flow rate results from the rotation of the blower in a reverse direction.

Joslin makes no suggestion that the motor is anything other than a reversible motor, and, there is no suggestion that the motor operates at a different speed in the reverse direction. Therefore, Applicants respectfully submit that nothing in Joslin is suggestive of a variable speed blower.

Applicants further respectfully traverse the assertion in the Response to Arguments that Rickard describes or suggests a controller that at least one of a voltage or

current to a heater element. Rickard, at col. 7, lines 17-20 states that "[e]nergization of heater elements 32 and 33 is controlled by gating signals applied to gate terminal 84a of triac 84 from microcontroller 60." At col. 7, lines 45-50, it is indicated that "[t]he inlet air temperature control means includes an appropriate pre-programmed portion of controller 60, responsive to the temperature signal from thermistor 52 and triac 84. Triac 84 controls the duty cycle of heater elements 32 and 33 in response to trigger signals from controller 60."

Applicants concede that a triac can be used to switch power on and off to the heater elements. However, Rickard only indicates that the triac is used to control a duty cycle of the heater elements. A duty cycle, as is customarily used in the art, refers to the amount of time in a given time interval that a device is in operation, or turned on. The device is turned off during the remainder of the time in the time interval. Rickard gives no indication that anything more is meant by a duty cycle. It can therefore only be concluded that the triac is used to switch power, or current, to the heater elements on and off based on gate signals from the controller. To one of ordinary skill in the art, this would not be synonymous with varying the current or voltage to the heater elements. Applicants respectfully submit, therefore, that Rickard does not, in fact, describe or suggest varying a voltage or current to the heater elements.

The rejection of Claims 1, 4, 5, and 23 under 35 U.S.C. § 102(b) as being anticipated by Joslin (U.S. Pat. No. 5,555,645) is respectfully traversed.

Joslin describes a clothes dryer (10) that includes a heater (12). The heater communicates with a rotatable drum (14) for containing an article or articles to be dried. An electric motor (16) provides motive force for the drum and for a blower (20). A temperature sensor (18) senses the temperature of air entering the drum. The blower draws air through the heater, by the sensor, and into the drum before exhausting the air

from the dryer. A controller (22) controls the operation of the motor, including the direction of rotation. The blower provides two different air flow rates depending on the direction of rotation. The controller also controls the operation of the heater. The controller is responsive to the temperature sensed by the sensor. The sensor may cause a controller (22) to cycle the heater off and on as a temperature limit is successively exceeded and dropped below, respectively. Notably, Joslin describes the blower as a squirrel cage blower which is typically designed to have a maximum flow rate corresponding to revolution in a particular direction, e.g., the forward direction. When the blower is operated in the opposite direction, e.g., the "reverse direction", the blower still moves air in the same direction, but at a reduced rate (col. 2, lines 19-24).

Claim 1 recites "[a] method of controlling the operation of a dryer including both a variable heat source and a variable speed blower, a drum including a cavity configured to hold an article to be dried, and a first motor drivingly coupled to the drum to rotate the drum, said method comprising rotating the drum; and varying only one of the variable heat source and the variable speed blower, while maintaining the other one in a fixed state."

Joslin neither describes nor suggests the method recited in Claim 1. More specifically, Joslin does not describe or suggest varying only one of a variable heat source and a variable speed blower, while maintaining the other one in a fixed state. Rather, Joslin describes a blower that generates a first airflow rate when operated in a forward direction and a second airflow rate when operated in the reverse direction. The variation in flow rate is described as being attributable only to the blower's direction of rotation and not to a change in speed. In addition, Joslin does not describe a variable heat source. Rather, Joslin describes a heater that is cycled on and off in response to a sensor.

Applicants respectfully disagree with the assertion in the Office Action that a variable heat source is described at col. 2, lines 52-58, wherein Joslin states:

> "This embodiment can be implemented with a mechanical timer coupled with an electronic motor direction control.
>
> The operation of the heater 12 by the controller 22 in this embodiment is in accordance with well-known practices in the field of domestic clothes dryers. For example, a thermostat may cycle the heater off and on as a temperature limit is successively exceeded and dropped below, respectively."

The referenced passage merely describes a thermostat that may cycle the heater on and off. Nowhere in Joslin is the heater described as having any capability beyond being turned on and off. Applicants respectfully submit that on and off conditions are inherent in any heater, and that anyone of ordinary skill in the art would understand that a variable heat source includes more than the capability of the heater to be turned on and off. In paragraph 37 of the present application, heater control by varying voltage and current to the heater is described. In paragraph 39, maintaining drum outlet temperature by gradually reducing voltage and/or current to the heater, rather than turning the heater completely off, is described. In paragraph 48, reference is made to adjusting the heater power level P to control the inlet and outlet temperatures.

Further, Joslin, at col. 1, lines 34-47 only makes reference to the capability of operating the motor and drum in both forward and reverse directions. A reversible motor does not suggest a variable speed motor.

Therefore, Joslin neither describes nor suggests either a variable heat source or a variable speed motor as recited in Applicants' Claim 1. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Joslin.

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Claim 4 recites a dryer for tumble drying articles that includes "a drum comprising a cavity configured to hold articles to be dried...a first motor drivingly coupled to said drum to rotate said drum...a variable heat source in flow communication with said cavity...and a variable speed motor drivingly coupled to a blower positioned to deliver air heated by said heat source to said cavity."

Joslin neither describes nor suggests the apparatus recited in Claim 4. More specifically, Joslin does not describe nor suggest a dryer that includes both a variable heat source and a variable speed motor drivingly coupled to a blower. Rather, Joslin describes a blower that generates a first airflow rate when operated in a forward direction and a second airflow rate when operated in the reverse direction. The variation in flow rate is described as being attributable only to the blower's direction of rotation and not to a change in speed. In addition, Joslin does not describe a variable heat source. Rather, Joslin describes a heater that is cycled on and off in response to a sensor. Accordingly, Claim 4 is submitted to be patentable over Joslin.

Claim 5 depends from Claim 4. When the recitations of Claim 5 are considered in combination with the recitations of Claim 4, Applicants submit that dependent Claim 5 likewise is patentable over Joslin.

Claim 23 recites a dryer control system for a tumble type dryer "having a variable heat source and a variable speed blower motor driving the blower to supply air heated by the heat source to the dryer cavity through a cavity inlet and exhaust air from the dryer cavity through a cavity outlet, said system comprising: at least one temperature sensor positioned to sense a temperature associated with the dryer and configured to generate a temperature signal representative of the sensed temperature...and a controller operatively coupled to said at least one temperature sensor and configured to receive the temperature signals, said controller configured to control the operation at least one of the variable

speed blower motor and the variable heat source in a plurality of control modes based on the received signals."

Joslin neither describes nor suggests the apparatus recited in Claim 23. More specifically, Joslin does not describe nor suggest a tumble dryer that includes both a variable heat source and a variable speed blower motor. Rather, Joslin describes a blower that generates a first airflow rate when operated in a forward direction and a second airflow rate when operated in the reverse direction. The variation in flow rate is described as being attributable only to the blower's direction of rotation and not to a change in speed. In addition, Joslin does not describe a variable heat source. Rather, Joslin describes a heater that is cycled on and off in response to a sensor. Accordingly, Claim 23 is submitted to be patentable over Joslin.

For at least the reasons set forth above, Applicants respectfully request that the 35 U.S.C. § 102 rejection of Claims 1, 4, 5, and 23 be withdrawn.

For at least the reasons set forth above, Applicants respectfully request that the 35 U.S.C. § 102 rejection of Claims 1, 4, 5, and 23 be withdrawn.

The rejection of Claims 15-20 under 35 U.S.C. 102(b) as being anticipated by Rickard (U.S. Pat. No. 4,397,101) is respectfully traversed.

Rickard describes a dryer (10) that includes a drum (16), a pair of electric heating elements (32 and 33), an inlet air temperature sensor (52), an outlet air temperature sensor (54), and a controller (60). The controller is operatively coupled with the electric heating elements, through a triac switch (84) and receives temperature signals from the inlet air temperature sensor and the outlet air temperature sensor.

Claim 15 recites a heater control for a tumble type dryer that includes "a heater element supplying heated air to a drum comprising a cavity...at least one temperature sensor providing a signal indicative of cavity outlet temperature...and a controller operatively coupled to said heater element and said at least one temperature sensor and configured to vary at least one of a voltage and a current to said heater element based on said signal from said temperature sensor to substantially maintain a predetermined cavity outlet temperature."

Rickard neither describes nor suggests the apparatus recited in Claim 15. More specifically, Rickard does not describe or suggest a controller configured to vary at least one of either voltage or current to the heater element based on a signal from the temperature sensor. Rather, Rickard describes a controller that turns heater elements on and off through a triac switch to control a duty cycle of the heater elements. Accordingly, Claim 15 is submitted to be patentable over Rickard.

Claims 16-20 depend from independent Claim 15. When the recitations of Claims 16-20 are considered in combination with the recitations of Claim 15, Applicants submit that dependent Claims 16-20 likewise are likewise patentable over Rickard.

For at least the reasons set forth above, Applicants respectfully request that the 35 U.S.C. § 102 rejection of Claims 15-20 be withdrawn.

For at least the reasons set forth above, Applicants respectfully request that the 35 U.S.C. § 102 rejections of Claims 15-20 be withdrawn.

The objection to claims 2, 3, 6-10, 21, 24, and 25 is respectfully traversed.

Applicants thank the Examiner for the indication of allowable subject matter in Claims 2, 3, 6-10, 21, 24, and 25. Claims 2 and 3 depend from independent Claim 1.

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Claims 6-10 depend from independent Claim 4. Claim 21 depends from independent Claim 15. Claims 24 and 25 depend from independent Claim 23. It is respectfully submitted that the respective base claims (Claims 1, 4, 15, and 23) are patentable over the cited art as indicated above.

Accordingly, Applicants respectfully request that the objection to claims 2, 3, 6-10, 21, 24, and 25 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

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